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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,339	09/23/2003	Shogo Hirose	117255	9283

25944 7590 12/06/2007
OLIFF & BERRIDGE, PLC
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EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1797

MAIL DATE	DELIVERY MODE
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12/06/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/667,339

Applicant(s)

HIROSE ET AL.

Examiner

Jennifer A. Leung

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2007 and 19 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-21 is/are pending in the application.
- 4a) Of the above claim(s) 13-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-12 and 16-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1,2 and 4-21 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Jennifer A. Leung

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on August 3, 2007 and September 19, 2007 have been entered.

Response to Amendment

2. Applicant's amendment submitted on August 3, 2007 and Applicant's supplemental amendment submitted on September 19, 2007 have been carefully considered. Claim 3 is cancelled. Claim 21 is newly added. Claims 13-15 are withdrawn. Claims 1, 2, 4-12 and 16-21 are under consideration.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 16, 17, 19 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 16, it is unclear as to where the newly added limitation of each slit “having a length that is at least twice the width” (see line 10) is supported in the originally filed disclosure. Applicant indicates that support is found in the preferred dimensions discussed in paragraph [0024] of the specification. However, the Examiner is unable to locate the “2:1” endpoint for the ratio of length to width, or any discussion of the slit dimensions being selected as a function of the ratio of length to width. Furthermore, the limitation of implies that there is no upper limit to the range. However, it is noted that section [0024] specifically sets maximums as well as minimums for the ratio, given that there exists an “upper limit” to the slit length and a “lower limit” to the slit width.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 2, 4, 9-12, 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manson (US 6,248,689) in view of Tomita et al. (US 4,464,185).

Regarding claims 1, 2 and 4, Manson (see FIG. 1; column 6, lines 11-27) discloses a honeycomb structure (i.e., physical catalyst support **100**) comprising: a plurality of through channels (i.e., passageways **106** and **110**) separated by porous partition walls (i.e., constructed of a porous refractory metal or metal oxidic support; see claim 1) and extending in an axial direction of the honeycomb structure, wherein all of said through channels have plugging portions (i.e., plugs **112**), respectively, that plug alternately at either one end of the honeycomb structure or its opposite end in a checkered flag pattern, and wherein at least one slit (i.e., opening **108**) per through channel is formed in the vicinity of the plugging portion of the partition walls surrounding the respective through channels, said at least one slit **108** being linearly formed in an axial direction to which the through channels extend.

As illustrated in FIG. 1, the length of each slit **108** appears to be substantially longer than the width of each slit **108**. Also, as illustrated in FIG. 1, the length of each slit **108** appears to be much shorter than half the length of the honeycomb structure **100**. Manson, however, does not specify the precise dimensions of width and length for each slit **108**.

In any event, the claimed dimensional ranges of width and length for each slit **108** do not confer patentability to the claim, since the precise dimensions for each slit would have been considered a result effective variable by one having ordinary skill in the art, as evidenced by Tomita et al. For instance, Tomita et al. teaches a honeycomb structure comprising slits in the form of gas blowing holes **32** or **6** (see FIGs. 2 or 6), wherein,

“The maximum opening area of each blowing pore **32** formed in the separator wall **3** is equal to the sectional area of each axially extending passage **21** or **22**. When the

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opening area of each blowing pore exceeds the sectional area of the passage **21** or **22**, almost all the exhaust gases pass through the blowing pores without interfering with the separator walls and are discharged from the outlet passages so that the carbon particles are neither caught nor collected by the filter.” (see column 4, lines 19-28); and

“The pressure loss and the collecting efficiency were measured in relation to the opening area of the exhaust gas blowing holes **6**... As a result, the proper opening area of the blowing holes **6** was 0.5 to 10% of the total opening area of the passages **2**,” (see column 5, lines 16-24).

Accordingly, one having ordinary skill in the art would have routinely optimized the values of length and width for each slit **108** in the apparatus of Manson to achieve the desired opening area for each slit, in order to obtain the desired amount of pressure loss and particle collecting efficiency in the system, *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 9, Manson discloses that the honeycomb structure **100** carries an oxidation catalyst on at least in the vicinity of the slits (see column 4, line 66 to column 5, line 2; and column 5, line 16 to column 6, line 4).

Regarding claim 10, Manson discloses the partition walls have filterability, wherein the honeycomb structure, when used as a filter, filters particulate materials included in a dust-containing fluid (i.e., the honeycomb structure **100** is a filter, constructed of a porous refractory metal or metal oxidic support, suitable for treating hot exhaust containing diesel soot and other unburned hydrocarbons from an internal combustion engine; see column 4, lines 9-26; claim 1).

Regarding claim 11, Manson discloses that a sectional shape of the through channel is one of triangular, quadrangular, hexagonal, or circular (see FIGs. 2A, B; column 6, lines 31-40).

Regarding claim 12, Manson discloses that the honeycomb structure **100** is made of, e.g., alumina (see column 6, lines 31-40).

Regarding claim 18, Manson discloses that the dust containing fluid is an exhaust gas of an internal combustion engine in communication with the honeycomb structure (see column 4, lines 9-16).

Regarding claim 21, as best understood, the slits **108** are constructed and arranged to accommodate effective discharge of ashes by flow of exhaust gas (see column 6, lines 11-25). Furthermore, a claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

5. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Manson (US 6,248,689) in view of Tomita et al. (US 4,464,185), as applied claim 1 above, and further in view of Hidaka et al. (EP 1 128 031).

The collective teaching of Manson and Tomita et al. is silent as to varying the slit length, such that the length of the slits in the vicinity of the outer peripheral portion of the honeycomb structure is longer than the length of the slits located in a central portion of the honeycomb structure. Hidaka et al. teaches a honeycomb structure wherein the length of the slits in the vicinity of the outer peripheral portion of the honeycomb structure is longer than the length of the slits located in a central portion of the honeycomb structure **1** (see section [0054]). It would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the slits **108** in the modified honeycomb structure of Manson such that the length of

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the slits in the vicinity of the outer peripheral portion of the honeycomb structure was longer than the length of the slits located in a central portion of the honeycomb structure, on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because such a configuration would enable the filtrate to be more efficiently discharged to the external space, as taught by Hidaka et al.

An increase in slit length is directly proportional to an increase in the slit open area. Although Hidaka et al. is silent as to teaching other means for increasing the slit open area (e.g., by increasing the number of slits at the outer periphery, or by increasing the width of the slits and the outer periphery, whereby the width of the slit would vary from slit to slit), it would have been obvious for one of ordinary skill in the art at the time the invention was made to select other suitable means for increasing the slit open area in the modified honeycomb structure of Manson, on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the substitution of known equivalent structures involves only ordinary skill in the art, and the substitution of known equivalent techniques, e.g., for enlarging the slit open area at the outer periphery, would have been obvious. *Ex parte Novak* 16 USPQ 2d 2041 (BPAI 1989); *In re Mostovych* 144 USPQ 38 (CCPA 1964); *In re Leshin* 125 USPQ 416 (CCPA 1960); *Graver Tank and Manufacturing Co. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950); *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

6. Claims 16, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwamoto et al. (US 5,853,459) in view of Manson (US 6,248,689) and Tomita et al. (US 4,464,185).

Regarding claim 16, Kuwamoto et al. discloses a system for purifying an exhaust gas containing carbon particulates, said system comprising: a honeycomb structure (i.e., exhaust gas filter **15a**, **15b**, FIG. 3; wherein the filter is shown in detail in FIGs. 1, 2) comprising,

a plurality of through channels (i.e., through holes **3**) separated by porous partition walls (i.e., through hole diaphragms **2**) and extending in an axial direction of the honeycomb structure; wherein all of said through channels **3** have plugging portions (i.e., sealing portions **4**), respectively that plug alternately at either one end of the honeycomb structure or its opposite end in a checkered flag pattern (see FIG. 2); and heating means (**17a**, **17b**; FIG. 3) for burning the particulate materials filtered by the honeycomb structure **15a,15b** to regenerate a filterability.

Kuwamoto et al. is silent as to the honeycomb structure comprising the instantly claimed honeycomb structure, including at least one slit per through channel formed in the vicinity of the plugging portion of the partition walls surrounding the respective through channels.

Manson teaches a honeycomb structure **100** suitable for use in a system for purifying an exhaust gas containing carbon particulates (see, e.g., column 4, lines 9-45), said honeycomb structure **100** (see FIG. 1; column 6, lines 11-27) comprising a plurality of through channels (i.e., passageways **106** and **110**) separated by porous partition walls (i.e., constructed of a porous refractory metal or metal oxidic support; see claim 1) and extending in an axial direction of the honeycomb structure, wherein all of said through channels have plugging portions (i.e., plugs **112**), respectively, that plug alternately at either one end of the honeycomb structure or its opposite end in a checkered flag pattern (see figure). Specifically, Manson teaches that at least one slit (i.e., opening **108**) per through channel is formed in the vicinity of the plugging portion

of the partition walls surrounding the respective through channels. Manson further teaches that it is conventionally known in the art to employ, “honeycomb-like structures, often with blocked passageways and small openings between adjacent passageways,” for purifying exhaust gases that contain particulate carbon. (see column 1, lines 55-63).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute the honeycomb structure of Manson for the honeycomb structure in the apparatus of Kuwamoto et al., for the known and expected result of purifying the carbon particulates contained in the exhaust gas stream, because the substitution of known equivalent structures involves only ordinary skill in the art, *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958), and when the prior art is altered by the mere substitution of one element for another already known in the field, the combination must do more than yield a predictable result, *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (2007). Furthermore, Manson teaches that this honeycomb structure 100 “doesn’t easily clog” (see column 6, lines 26-28). Accordingly, one having ordinary skill in the art would have further recognized the desirability of employing the honeycomb structure of Manson in the apparatus of Kuwamoto et al., since the need for frequent regeneration of the honeycomb structure would be reduced.

As illustrated in FIG. 1 of Manson, the length of each slit 108 is substantially longer than the width of each slit 108. Manson, however, does not specify that the length of each slit 108 is “at least twice the width” of each slit 108.

In any event, the precise dimensions of the slits 108 do not confer patentability to the claim, since the precise dimensions would have been considered a result effective variable by

one having ordinary skill in the art, as evidenced by Tomita et al. For instance, Tomita et al. teaches a honeycomb structure comprising slits in the form of gas blowing holes **32** or **6** (see FIGs. 2 or 6), wherein,

“The maximum opening area of each blowing pore **32** formed in the separator wall **3** is equal to the sectional area of each axially extending passage **21** or **22**. When the opening area of each blowing pore exceeds the sectional area of the passage **21** or **22**, almost all the exhaust gases pass through the blowing pores without interfering with the separator walls and are discharged from the outlet passages so that the carbon particles are neither caught nor collected by the filter.” (see column 4, lines 19-28); and

“The pressure loss and the collecting efficiency were measured in relation to the opening area of the exhaust gas blowing holes **6**... As a result, the proper opening area of the blowing holes **6** was 0.5 to 10% of the total opening area of the passages **2**,” (see column 5, lines 16-24).

Accordingly, one having ordinary skill in the art would have routinely optimized the length of each slit **108** relative to the width of each slit **108** to achieve the desired opening area for each slit, in order to obtain the desired amount of pressure loss and particle collecting efficiency in the system, *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Lastly, with respect to the functional limitations recited in lines 13-18, a claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Regarding claim 17, the heating means 17a, 17b of Kuwamoto et al. meets the claim (see column 6, lines 48-53; column 9, lines 10-26).

Regarding claim 19, Kuwamoto et al. discloses that an internal combustion engine (i.e., a diesel engine 6; FIG. 3) is in communication with the honeycomb structure.

Regarding claim 20, expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim. *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969), and the inclusion of a material or article worked upon by a structure being claimed does not impart patentability to the claims. *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935); *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963). Thus, the recitation of a non-burnable material comprising ashes adds no further patentable weight to the claim.

Response to Arguments

7. Applicant's arguments filed on September 19, 2007 with respect to the rejection under 35 U.S.C. 112, first paragraph, have been fully considered but they are not persuasive. It is noted that claim 16 now contains the limitation of a slit, "having a length that is at least twice the width", which limitation is not supported in Applicant's originally filed disclosure. As noted above, the Examiner is unable to locate the "2:1" endpoint for the ratio of length to width, *or any discussion of the slit dimensions being selected as a function of the ratio of length to width*. Furthermore, the limitation of implies that there is no upper limit to the range. However, it is noted that section [0024] specifically sets maximums as well as minimums for the ratio, given that there exists an "upper limit" to the slit length and a "lower limit" to the slit width.

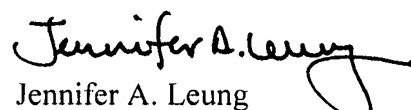
8. Applicant's arguments filed August 3, 2007 and September 19, 2007 with respect to the rejections of claims 1, 2, 4-12 and 16-21 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejections are withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the newly found prior art, to Manson.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Jennifer A. Leung
December 4, 2007